

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

MEADOR, et al.

Serial No. : 10/784,045

Filed: February 20, 2004

THERMALLY CURABLE MIDDLE LAYER
FOR 193-NM TRILAYER RESIST PROCESS

Docket No.: 32849

Confirmation No.: 6833

Group Art Unit No.: 1712

Examiner: Moore, Margaret G.

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

DECLARATION UNDER 37 C.F.R. § 1.131

1. I, Jim D. Meador, am one of the inventors named in the above-referenced patent application. I am making this declaration to establish invention of the subject matter claimed in the above-referenced patent application on a date prior to August 5, 2003, the filing date of U.S. Patent Publication No. 2005/0031964 by Babich et al.

2. Pages 43-44 from lab notebook 2404 are attached as Exhibit A. Exhibit A describes a composition within the scope of independent composition claims 41, 89, and 95. Each limitation of these claims can be found in Exhibit A. Page 43 of Exhibit A describes the preparation of a polyhedral oligomeric silsesquioxane ("POSS") with an alcohol functionality as claimed. That is, methacryl ethyl-POSS is polymerized with hydroxypropyl methacrylate to form a POSS polymer having an alcohol (-OH) functionality.

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3. Page 44 of Exhibit A describes using the POSS having an alcohol functionality (discussed in Paragraph 2 above and referenced as "JM2404-43") to prepare a composition. The POSS having an alcohol functionality is dissolved or dispersed in a solvent system (PGMEA in this instance). As recited in claims 41 and 95, the composition includes a cross-linking agent (i.e., PWL, which is an abbreviation for the aminoplast crosslinking agent sold under the name Powderlink® 1174). Claim 89 also recites the presence of a strong acid and a weak acid. This is also shown on page 44 of Exhibit A in that the composition includes both *p*-TSA (*p*-toluenesulfonic acid monohydrate, a strong acid that is also a catalyst) and bisphenol S (a weak acid). Page 7, lines 8-18 of the application as filed define strong and weak acids and list examples of each. Bisphenol S is listed as a preferred weak acid, while *p*-TSA is listed as a preferred strong acid.

4. The next-to-last paragraph on page 44 of Exhibit A describes how the composition was spin-coated onto a substrate at 1,500 rpm followed by baking to give a layer having a thickness of 669.7 Å. The baked film was insoluble in ethyl lactate. These steps, in combination with the use of the composition described in Paragraph 3 above, shows the presence of each of the limitations of independent structure claims 53 and 91 and independent method claims 71 and 94.

5. The dates on Exhibit A have been blocked out. However, I declare that these dates are earlier than August 5, 2003, and that they show invention by my coinventors and me of the claimed subject matter prior to August 5, 2003.

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6. A page entitled "HML JM2404-44 on ARC29A with GARS8107A10: Processing Conditions" is attached as Exhibit B. "JM2404-44" refers to a composition described in Paragraph 3 above. Exhibit B shows the stack and processing conditions (spin speeds, curing conditions, film thicknesses, exposure and developments steps) used to form a layer of the composition of Exhibit A on a substrate coated with a bottom anti-reflective coating, to apply a photoresist (GARS8107A10) to that composition layer, and to pattern the photoresist. Thus, the photoresist limitation recited by independent claims 90 and 92-93 is provided by Exhibit B. Of course, the remaining limitations of claims 90 and 92-93 are described earlier in this Declaration.

7. The date on Exhibit B has been blocked out. However, I declare that these dates are earlier than August 5, 2003, and that they show invention by my coinventors and me of the claimed subject matter prior to August 5, 2003.

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8. I further declare that all statements made herein of my own knowledge are true and that statements made herein on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this Declaration is directed.

Jim D. Meador
Jim D. Meador

March 12, 2007
Date